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| 10/021,708 | 12/19/2001 | Shunpei Yamazaki | 740756-2412 | 2302 |
| 31780 | 7590 | 03/24/2008 | | |
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| EXAMINER | | | | |
| PAIK, SANG YEOP | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 3742 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/021,708

Applicant(s)

YAMAZAKI, SHUNPEI

Examiner

Sang Y. Paik

Art Unit

3742

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/17/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-212 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-56, 62, 71, 80, 89, 98, 106, 107, 116, 125, 134, 143, 152, 161, 170, 179, 188, 197 and 201-212 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-846)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/22/07.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Disposition of Claims: Claims ~~withdrawn~~ from consideration are 57-61,63-70,72-79,81-88,90-97,99-106,108-115, 117-133, 135-142, 144-151, 153-160, 162-169, 171-178, 180-187, 189-196, 198-200.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 25, 26, 29, 30, 33, 34, 41, 42, 45, 46, 49, 50-52, 62, 80, 98, 152, 170, 179, 209 and 211 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishitani et al (US 6,414,280) in view of Morita et al (US 6,060,697) and Elliott (US 5,006,695).

Nishitani shows the method claimed including the steps of heating a substrate for deposition of a semiconductor film in a reaction tube with a light lamp source such as a halogen lamp wherein the intensity of the light is changed due to the switching on and off of the light source, the light source in a first stage wherein the switch is turned on within a cycle of one second or shorter, the light source in a second stage wherein the switch is turned off after the desired heating temperature is achieved. But, Nishitani does not show a plurality of light pulses wherein each light pulse has a cycle of one second or longer.

Morita shows that it is known in the art to provide a semiconductor manufacturing device using lamps or resistors as heating sources that are turned on and off to control the current applied to the heating sources and to maintain the desired heating temperature.

Elliott shows that it is well known in the art that a heating system is provided with a heating element wherein the heating element in a first stage has a plurality of pulse forms that

turns the heating on and off in a high ratio, and as the heating element reaches the desired heating temperature in a second stage, the ratio of the on and off time is decreased.

In view of Morita and Elliott, it would have been obvious to one of ordinary skill in the art to adapt Nishitani with the plurality of light pulses having one second or longer light pulses in the respective first and second stages to quickly achieve and maintain the desired heating temperatures without overheating.

With respect to the recited computer chips, it is well known in the art that the wafer substrates shown in Nishitani are used for making computer chips, and since such chips are notoriously known in the art of making personal computers, it would have been obvious to one of ordinary skill in the art that to use the method of processing the wafer substrates of Nishitani for making the semiconductor devices such as the personal computers.

With respect to the recited quartz or glass substrates, it would have been obvious to one of ordinary skill in the art to provide the substrate made of glass as the wafer substrates since such is notoriously well known in the art.

3. Claims 27, 28, 31, 32, 35-40, 43, 44, 47, 48, 53-56, 71, 89, 107, 116, 125, 134, 143, 161, 188, 197, 201-208, 210 and 212 rejected under 35 U.S.C. 103(a) as being unpatentable over Nishitani in view of Morita and Elliott as applied to claims 25, 26, 29, 30, 33, 34, 41, 42, 45, 46, 49, 50-52, 62, 80, 98, 152, 170, 179, 209 and 211 and further in view of Granneman et al (US 6,461,439) or Johnsgard et al (US 6,399,921).

Nishitani in view of Morita and Elliott shows the method claimed except supplying a heated gas into the reaction tube.

Granneman and Johnsgard show that it is known in the art to provide a heated or conductive gas into the reaction tube to enhance the thermal transfer within the tube for heating the substrate. Furthermore, Granneman shows a reduced pressure in the reaction tube and Johnsgard shows a cooled gas introduced in the reaction tube to cool down the heated substrate.

In view of Granneman and Johnsgard, it would have been obvious to one of ordinary skill in the art to adapt Nishitani, as modified by Morita and Elliott, with the heated gas and reduced pressure to further enhance the thermal heat transfer from the light source to the substrate and further adapt with a cooling gas to cool down the heated substrate.

Response to Arguments

4. Applicant's arguments filed 12/17/07 have been fully considered but they are not persuasive.

The applicant argues Elliott does not show or teach a plurality of pulse forms. This argument is not deemed persuasive. As the applicant has observed on the drawing Figures 1 and 4, Elliott clearly shows a plurality of pulses forms that is applied to the heating mantle/element via a relay. It is noted that the Elliott is not applied to teach for emitting light but rather the controlling of a heating element in a pulsed form that is further controlled to change the ratio of such pulsed forms to further control the temperature.

Claim 204 has been inadvertently left out on page 3 of the office action that was mailed on 8/13/07 and it is now included. This office action is made non-final to make such correction.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (6:30-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sang Y Paik/

Primary Examiner, Art Unit 3742

Sang Y Paik

Primary Examiner

Art Unit 3742

syp